NIST Solid State Lighting

Measurement Assurance Program Round 2 (MAP2)

Round 2 of NIST Solid State Lighting (SSL) Measurement Assurance Program (MAP) began January, 2015. It is intended for laboratories accredited for IES LM-79 that need to participate in proficiency testing. The SSL products selected for this round are for general illumination, representative of the current residential market, and chosen to test specific measurement challenges. This Round offers three options for the customer as detailed in Table 1.

Table 1 - NIST SSL MAP2 Options

Option A – 37230M	Option B – 37240M	Option C – 37230M
Cree lamp (C)	Cree lamp (C)	Cree lamp (C)
Phillips lamp (W)	Phillips lamp (W)	Phillips lamp (W)
Bi-post OSRAM GU-10 (G)	Bi-post OSRAM GU-10 (G)	Bi-post OSRAM GU-10 (G)
Remote Phosphor Lamp (L)	Remote Phosphor Lamp (L)	Remote Phosphor Lamp (L)
Bi-pin 12 V AC (B)	Bi-pin 12 V AC (B)	Bi-pin 12 V AC (B)
Bi-pin 12 V DC (B)	Bi-pin 12 V DC (B)	Bi-pin 12 V DC (B)
Incandescent 4-pole socket 12 V AC (LV)	Incandescent 4-pole socket 12 V AC (LV)	Incandescent 4-pole socket 12 V AC (LV)
Incandescent 4-pole socket 4.2 A DC (LV)	Incandescent 4-pole socket 4.2 A DC (LV)	Incandescent 4-pole socket 4.2 A DC (LV)
	4 CFL	2 tubes (U and T)
Total: 8 Measurements	Total: 12 Measurements	Total: 10 Measurements
Cost: $4000.00	Cost: $5400.00	Cost: $4000.00

The approximate cost for Option A, service identification: 37230M is $4000.00 and includes 6 lamps with a total of 8 measurements. Within this option, five lamps with six measurements make up the IES LM-79 proficiency test. The manufacturers, model numbers, nominal values, and specifications of the SSL products for the proficiency test for IES LM-79 are given in Table 2.

Table 2 - Specifications for SSL mandatory products

Lamp type	Picture	Nomination, Specifications
Phillips EnduraLED 800 Series A19		L Type 120 V, 12 W, 2700K, 80 CRI
Sylvania Ultra LED MR16		B Type 12 V AC/DC, 6 W, 3000K, 85 CRI
CREE A19 Series LED Lamp		C Type 120 V, 9.5 W, 2700K, 80 CRI
Sylvania Ultra PAR16 LED lamps		G Type 120 V, 7 W, 3000 K, 84 CRI
Phillips LED A shape, medium base, E26		W Type 120V, 11 W, 5000K, 80 CRI

In addition, Option A contains an incandescent lamp, specification detailed in Table 3. Participants are asked to measure this lamp and the results are being collected for information only. The NIST report will include an analysis of these results but will not be included in the pass/fail requirement. Participants are asked to measure the LV lamps with AC and DC current. Results from NIST MAP 1 revealed the potential for a number of laboratories to have concerns with their 4-pole sockets. Measurements of this lamp will confirm or help diagnosis 4-pole socket issues.

Table 3 - Specifications for the incandescent lamp

Lamp type	Picture	Nomination, Specifications
Bulbrite Frosted E26 medium screw		LV Type 50 W, 12 V AC/ 4.2 A DC

Option B, service identification number is 37240M has an additional proficiency test using four compact fluorescent lamps (CFL) for an additional of $1400.00. Option C is option A and same service identification number with two additional four foot SSL tubes for no additional cost. Table 4 lists the specifications of these tubes. The U type lamp is supplied with a ballast that shall be mounted very close to the lamp (in the sphere). At a minimum the electrical properties of the lamp plus the ballast shall be measured. Additionally the testing laboratory may measure the electrical properties of the lamp operation (after the ballast), but will require a power analyzer capable of measuring an 80 kHz signal. The T type lamp has no ballast and only requires 120 V AC to be applied across the opposite pins.

Table 4 - Specifications for the two four foot tubes

Lamp type	Picture	Nomination, Specifications
Philips LED T8 InstantFit		U type 14.5 W, 100-240V, 80 CRI, 50/60 Hz
Philips EnduraLED T8		T type 19 W, 100-277 V, 85 CRI, 50/60 Hz

The participants shall follow the methods in LM-79, specifically section 5. The following properties will be measured and compared: total luminous flux (lm), RMS voltage (V), current (A), electrical power (W), Luminous efficacy (lm/W), power factor, chromaticity coordinates (x, y), correlated color temperature (K), and color rendering index (CRI). This MAP program will be conducted as a star-type comparison. All sets will be initially measured by NIST, and then sent to participants for measurements. All sets will be measured by NIST upon return. The assigned values will be determined from the average of the NIST measurements and the stability of each artifact. After receiving the lamps, participants will have 8 weeks to return the lamps and results to NIST.

This round will be different from Round 1. You will return the lamps along with the test results. There will be no preliminary review of results. You are not allowed to keep a set of lamps until the results are known. The lamps shall be returned so they can be retested and forwarded to other laboratories for testing. You will receive a report with pass/fail on the proficiency test lamps. The pass/fail criteria are +/- 4 % for many of the properties. The general protocol issued with the set of artifacts contains the specific details. Some lamps will be identified as critical lamps. Other lamps are included for informational purposes only. Many laboratories failing the MAP will implement corrective actions. If your corrective actions involve retesting a lamp or lamps, you must contact NIST and arrange to receive a similar lamp(s) for a fee (approximate $800 per lamp). This fee covers testing of the artifact(s) and consultation and is administered by NIST. Not all corrective actions require retesting of a NIST lamp. For example, there may have been an identifiable calculation mistake or calibration offset.

For any questions or concerns, please contact:

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